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From: CN=Burt Shephard/OU=R10/O=USEPA/C=US
Sent: Thur 12/6/2012 9:02:57 PM
Subject: Re: SWAC question

Helen,

The question I would ask back to Charlie and Marc is what are they trying to evaluate with a SWAC? Sitewide average? Average sediment concentration in a section of a site needed to protect a species with a known home range? Which polygons or areas within a larger site to remediate first to bring the larger area into compliance with a remedial goal?

We were fortunate at Portland to have empirical site specific home range information for several fish species. In my experience, that's extremely rare. We used it to define home ranges and exposure areas of several fish species in the Portland Harbor BERA, including the smallmouth bass data you mentioned in your message.

Whether that information gets used in the feasibility study to define a remedial goal or the areal extent to which a remedial goal applies has not been decided at this time. We have calculated preliminary remedial goals for sediment based on risks from several chemicals to smallmouth bass, essentially a food web model run backwards, starting with bass tissue or diet concentrations with acceptable levels of risk. For total PCB, the site specific sediment PRG worked out to be 64 µg/kg dry wt. sediment. (background total PCB in sediment = 17 µg/kg, sitewide PCB in sediment average concentration is about 100 µg/kg, with highest concentrations around 26,000 µg/kg).

I can tell you that the human health fish and shellfish consumption scenarios for Portland all result in human health based PCB sediment PRGs below the background concentration of 17 µg/kg. So its conceivable that an ecological risk scenario could drive the PCB remediation, since none of our ecologically based PCB in sediment PRGs are lower than the 17 µg/kg PCB background value.

For context, the Portland Harbor study area is currently defined as a 9.9 mile reach of the Willamette River, so the entire site is much larger than the empirically determined smallmouth bass home range.

Best regards,

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"Facts are stubborn things"
- John Adams

From: Helen Bottcher/R10/USEPA/US
To: Marc Greenberg/ERT/R2/USEPA/US@EPA, camenzie@exponent.com, Burt Shephard/R10/USEPA/US@EPA,
Date: 12/05/2012 01:31 PM
Subject: SWAC question

Hi, Marc and Charlie.

In response to your SWAC question it depends.

At the Portland Harbor site, I argued that the SWACs should be calculated on multiple scales, to match the home range of the species we were trying to protect. Happily, we had some really good data on fish behavior and usage of the site from a radio-tagging survey. Turns out that smallmouth bass at that site have a pretty small home range. They rarely move up or down river more than a mile, and they almost never cross over the main channel to the other side of the river. So to calculate exposure to smallmouth bass, I recommended SWACs of 1 mile up and down the river, from the bank to the mid-line of the river. To protect sturgeon, which have a huge home range (think miles and miles), I would accept a much larger area.

I don't know if that's what ended up happening, though, because I left the project team before they finished the risk assessment. So I am copying Burt Shephard, who is the risk assessor for the project.

Bottom line -- the appropriate size of the SWAC area should be based on the organisms you are trying to protect. This gets tricky, because some will argue that benthic invertebrates (say freshwater mussels) don't move, so in order to protect them, you have to clean all the sediment down to protective levels. That's where the community vs. population argument comes in ...

Hope this helps.

Burt, in case you didn't see the original question, here's what Charlie asked:

Can you give me some suggestions. I was looking for info on the spatial scale of sediments in larger water bodies for which a SWAC may apply. I know there is quite a range but I am focusing on larger areas for which an MNR approach might be appropriate. What I am searching for are case studies.